REMARKS

Claims 1 – 20 remain pending in the present application. No claim amendments have been made. Applicants respectfully submit that no new matter has been added. It is therefore believed that this Response Under 37 C.F.R. §1.116 is fully responsive to the Office Action dated February 13, 2004.

As To The Merits:

As to the merits of this case, the Examiner maintains the following rejections:

1) claims 1-3, 5-7 and 9 – 20 stand rejected under 35 U.S.C. §102(e) as being anticipated by Tanaka et al. (U.S. Patent No. 6,567,972, of record); and

2) claims 4 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka et al.

Each of these rejections is respectfully traversed.

In response to Applicants' arguments that Tanaka fails to disclose "detecting a target pattern in a device forming region on a mask, comprising: selecting, as an alignment pattern in the device region, the alignment pattern for setting a position at which the detection of the target pattern is performed, from among a group of patterns included in a region near the target pattern, the region in the device forming region, a pattern having a barycenter position at a barycenter of the pattern in a first direction, the barycenter position that is not displaced from a predetermined barycenter even if the patterns are deformed when the patters are formed on the mask; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; and detecting the target pattern based on the alignment reference coordinates," as recited in the independent claims, the Examiner offers the following response:

> Applicant's arguments fail to comply with 37 C.F.R. §1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Accordingly, the rejections of claims 1 through 20 stand.1

In addition, the Examiner asserts at page 2 of the Action, "Tanaka teaches a method of selecting reference patterns whose edges are not moved by OPE. If the edges of the pattern to be selected as a reference have not moved, the barycenter position of the pattern will not have moved in either a first or second direction. The reference pattern is then used to detect the to-be-corrected pattern (column 2, line 29-column 3, line 35)" and thus concludes that Tanaka teaches the limitations of the independent claims of the present application. However, at the section in columns 2 to 3, Tanaka merely discloses classifying the extracted patterns into to-be-corrected patterns whose edges are actually to be displaced in calculating the correction and a reference pattern whose edges are not displaced in calculating the correction. Tanaka fails to even suggest detecting the to-be-corrected patterns based on the reference pattern. Therefore, it is difficult for the Applicants to specifically point out how the language of the claims patentably distinguishes them from the references when the references do not even suggest anything related to the language of the claims. If the Examiner is to properly argue that the language of the claims are disclosed by Tanaka, the Examiner is requested to more specifically indicate where the corresponding teaching is disclosed in Tanaka's disclosure.

Moreover, at set forth in Applicants' previous response, the present invention relates to a pattern detection method in which alignment reference coordinates are set in a region near a target pattern in a device forming region of a mask pattern formed on a mask for a

1 Please see, lines 3 – 7, page 5 of the Action.

semiconductor product, the target pattern to be a target of a test of the mask pattern such that the target pattern can swiftly and automatically be detected with high precision based on the alignment reference coordinates (*see* page 5, lines 7-12 of the specification).

Independent Claims 1, 11 and 19:

More specifically, independent claim 1 recites *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position at a barycenter of the pattern in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; and detecting the target pattern based on the alignment reference coordinates.* Independent claims 11 and 19 are drawn to similar embodiments.

For example, a group of patterns 11-13 is illustrated in Fig. 2 of the present invention for actual mask patterns 21-23 illustrated in Fig. 3, respectively. Since the center pattern data 12 is separated from each of the right and left pattern data 13 and 11 at a distance in which influence of pattern distance at the time of pattern forming can be ignored, the barycenter positions 16-18 of the patterns 11-13 is set as alignment reference coordinates. The target pattern is then detected based on the alignment reference coordinates.

Tanaka fails to disclose a method for detecting a mask pattern as disclosed by the present application. Instead, Tanaka relates to a method for correcting a mask pattern deviated due to optical proximity effects that arise when the mask patter is transferred onto a substrate, and particularly relates to a method for correcting the mask pattern in consideration of various deviations that are assumed in the optical lithography process (deviations in exposure does, focusing, etc.), as described in column 1, lines 19 to 25.

In other words, Tanaka fails to disclose the features of independent claims 1, 11 and 19 concerning *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position at a barycenter of the pattern in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; and detecting the target pattern based on the alignment reference coordinates.*

Independent Claims 5, 14 and 20:

Independent claim 5 recites *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position at barycenters of the pattern in first and second directions, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region,*

the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern as alignment reference coordinates, and detecting the target pattern based on the alignment reference coordinates. Independent claims 14 and 20 are drawn to similar embodiments.

Independent claim 5 differs from that of independent claim 1 in that claim 5 calls for the extra feature that the barycenter position exists in the first as well as a second direction. As discussed above, Tanaka fails to disclose a method for detecting a mask pattern as disclosed by the present application.

Thus, it is respectfully submitted that Tanaka fails to disclose the features of independent claims 5, 14 and 20 concerning *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position at barycenters of the pattern in first and second directions, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern as alignment reference coordinates, and detecting the target pattern based on the alignment reference coordinates.*

Independent Claims 9 and 17:

Independent claim 9 recites *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask; as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target patter is performed; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; detecting the target pattern based on the alignment reference coordinates; and checking the target pattern detected.* Independent claim 17 is drawn to a similar embodiment.

Independent claims 9 and 17 differ from independent claim 1 in that independent claims 9 and 17 call for the extra feature of *checking the target pattern detected.* As discussed above, Tanaka fails to disclose a method for detecting a mask pattern as disclosed by the present application.

Thus, it is respectfully submitted Tanaka fails to disclose the features of independent claims 9 and 17 concerning *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target patter is performed; setting the barycenter position of the*

alignment pattern in the first direction as alignment reference coordinates; detecting the target pattern based on the alignment reference coordinates; and checking the target pattern detected.

Independent Claims 10 and 18:

Independent claim 10 recites *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a barycenter position at a barycenter pattern in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; detecting the target pattern based on the alignment reference coordinates; and correcting or processing the target pattern detected. Independent claim 18 is drawn to a similar embodiment.*

Independent claims 10 and 18 differ from independent claim 1 in that independent claims 10 and 18 each call for the extra feature of *correcting or processing the target pattern detected.* As discussed above, Tanaka fails to disclose a method for detecting a mask pattern as disclosed by the present application.

Thus, is it respectfully submitted that Tanaka fails to disclose the features of independent claims 10 and 18 concerning *selecting, from among a group of patterns included in a region near the target pattern, the region being in the device forming region, a pattern having a*

barycenter position at a barycenter pattern in a first direction, the barycenter position not being displaced from a predetermined barycenter even if the patterns are deformed when the patterns are formed on the mask, as an alignment pattern in the device forming region, the alignment pattern for setting a position at which the detection of the target pattern is performed; setting the barycenter position of the alignment pattern in the first direction as alignment reference coordinates; detecting the target pattern based on the alignment reference coordinates; and correcting or processing the target pattern detected.

In view of the aforementioned remarks, the claims are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully submitted,

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